

REMARKS

1. Status of the Claims

Claims 1-29 are pending.

Claims 14 and 15 have been converted from "use" claims to "method" claims.

No new matter has been added.

2. Rejections Based on 35 U.S.C. § 101

Claims 14 and 15 have been converted into method claims. As such, they are directed towards patentable subject matter. Reconsideration and withdrawal of the rejections of claims 14 and 15 based on 35 U.S.C. § 101 is requested.

3. Rejections Based on 35 U.S.C. § 102

Claims 1-13 and 16-29 stand rejected as allegedly being anticipated by Caselli *et al.*, (U.S. Patent No. 5,158,992). Specifically, Example 5 at Column 13 is alleged to be anticipatory. Applicants respectfully disagree.

Caselli describes stabilizing compositions that are liquids at room temperature or which comprise *inter alia* organic phosphites or phosphonites having a melting point below 100°C (cf. See Col. 1, lines 64-68 and Col. 3, lines 13-17 of Caselli).

In contrast, amended claim 1 is directed to a stabilized polymer composition comprising a polyolefin and an antioxidant composition, wherein in the antioxidant composition the phosphorous compound is selected from bis-(2,6-di-*t*-butyl-4-ethylphenyl)-pentaerythrityl-di-phosphite and bis-(2,4-dicumylphenyl)-pentaerythrityl diphosphite. Both compounds have melting points above 100°C and they are not

liquids at room temperature. The melting point of bis-(2,6-di-*t*-butyl-4-ethylphenyl)-pentaerythrityl-di-phosphite is 160-175°C, while that of bis-(2,4-dicumylphenyl)-pentaerythritol diphosphite is 225-235°C. Thus, Caselli does not anticipate amended claim 1.

With respect to the disclosure of Example 5 of Caselli, it should be noted that a liquid stabilizing mixture is disclosed therein, made up of pentaerythrityl-tetrakis-(3',5'-di-*tert*.-butyl-4-hydroxyphenyl)propionat (stabilizer A; Irganox 1010), tetrakis-(2,4-di-*tert*.-butylphenyl)-4,4'-biphenylene diphosphite (Sandostab PEPQ) and distearyl thiodipropionate (DSTD). However, as explained above, present claim 1 differs from Example 5; in amended claim 1 the phosphorous compound of the antioxidant composition can only be selected from bis(2,6-di-*t*-butyl-4-methylphenyl)pentaerythrityl-di-phosphite, and bis(2,4-dicumylphenyl)-pentaerythritol diphosphite, neither of which are liquids at room temperature or melt below 100°C. The aforementioned phosphorous compounds are not disclosed by Caselli and thus the subject-matter of new claim 1 is novel over Caselli. Reconsideration and withdrawal of this rejection is therefore respectfully requested.

4. Rejections Based on 35 U.S.C. § 103

Claims 1-13 and 16-29 stand rejected as allegedly being obvious in light of the disclosure of Caselli *et al.*, (U.S. Patent No. 5,158,992). Applicants respectfully disagree.

Caselli describes stabilizing compositions comprising organic phosphites and phosphonites having a melting point below 100°C. Upon reviewing the examples of

Caselli, it appears that only the composition of example 5 is comparable to the antioxidant composition of the present invention. Example 5, which provides the best long term heat stability of all examples of Caselli, distinguishes from the other examples mainly in the addition of distearyl thiodipropionate (DSTDP). However, the skilled man in the art would inevitably conclude that the thermal oxidation resistance provided in this Example is due to the presence of distearyl thiopropionate (DSTDP) and not due to the presence of the phosphorous compound (here: Sandostab PEPQ). This fact can be learned from the art recited in the introduction part of the present application and also directly from Caselli, as it is known that thioethers enhance the long term heat stability of polymers. For example, Example 4 uses an epoxidized linseed oil instead of DSTDP, whereas the phenolic and phosphorous compounds are the same as in Example 5. The thermal oxidation resistance at 150°C, however, is only 14 days in Example 4 compared to 50 days (!) in Example 5. Thus, it is clear that the increase in thermal stability in Example 5 over Example 4 is obtained by the use of DSTDP and not by the use of any particular phosphorous compound.

As stated above, it is generally known that phenol and thioether blends improve the long term heat stability of polyolefins. With respect to the additional use of phosphorous compounds, Caselli is totally silent concerning the effect of specifically selected phosphorous compounds for the use in phenol/thioether blends, i.e. it cannot be taken from Caselli that only the variation of the phosphorous compound would lead to a further improvement of the long term heat stability of polyolefins. In this respect, the state of the art (cf. page 5 of the present application) clearly teaches away from the

use of phosphorous compounds as main constituents for a stabilizing composition as not having significant influence on long term thermal ageing of polyolefins.

Further, the phosphorous compounds used in the composition as described in Caselli must be a liquid or have a melting point below 100°C. This is because liquid compositions are readily applied to the polymer particles. See Col. 2, lines 35-44 and Col. 8, lines 1-5. In contrast, the currently claimed high melting materials are not liquids at room temperature and do not melt below 100°C. Thus, they cannot be readily applied to the polymer particles.

In the present invention, however, it was surprisingly found that the claimed phosphorous compounds, in combination with the phenolic and sulphur-containing compounds, affords an antioxidant composition that provides superior long term heat stability properties. The data in table 2 of the present application clearly demonstrates this (cf. Examples 2, 3, 6, 7, 9 and 10 of Table 2 on page 20 of the present application). Caselli is silent with respect to the presently claimed composition and the influence of the different phosphorous compounds on the antioxidant properties of the composition.

Moreover, the polymer particles of the present invention are not coated with this composition (as in Caselli) but are used in, for example, extrusion processes. This further differentiates the currently pending claims from the disclosure of Caselli.

In light of the above, the currently pending claims are not obvious in light of the disclosure of the Caselli reference. Therefore, reconsideration and withdrawal of the obviousness rejection based on the Caselli reference is respectfully requested.

CONCLUSION

Applicants respectfully contend that all requirements of patentability have been met. Allowance of the claims and passage of the case to issue are therefore respectfully solicited.

Should the Examiner believe a discussion of this matter would be helpful, he is invited to telephone the undersigned at (312) 913-2114.

Respectfully submitted,

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